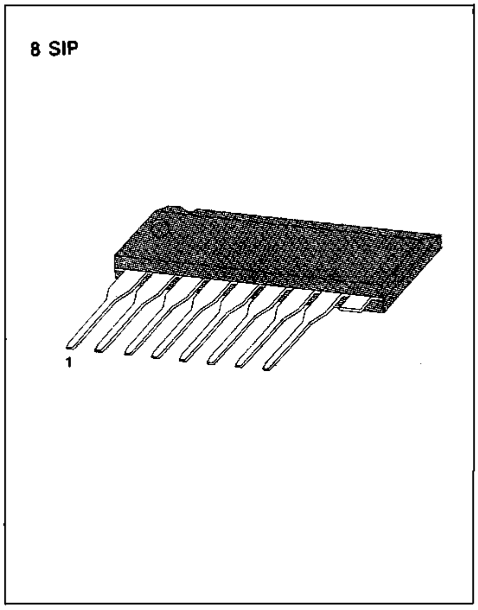
DUAL LOW NOISE EQUALIZER AMPLIFIER

The KA22211 is a monolithic integrated circuit consisting of a 2-channel pre-amplifier in a 8-pin plastic single in-line package.



FEATURES

- Recommended operating supply voltage range: $V_{CC} = 5V \sim 14V$
- Low noise ($V_{NI} = 1.0\mu V$: Typ)
- High channel separation
- Minimum number of external parts required

SCHEMATIC DIAGRAM

ORDERING INFORMATION

Device	Package	Operating Temperature
KA22211	8 SIP	$-20°C \sim +70°C$

BLOCK DIAGRAM

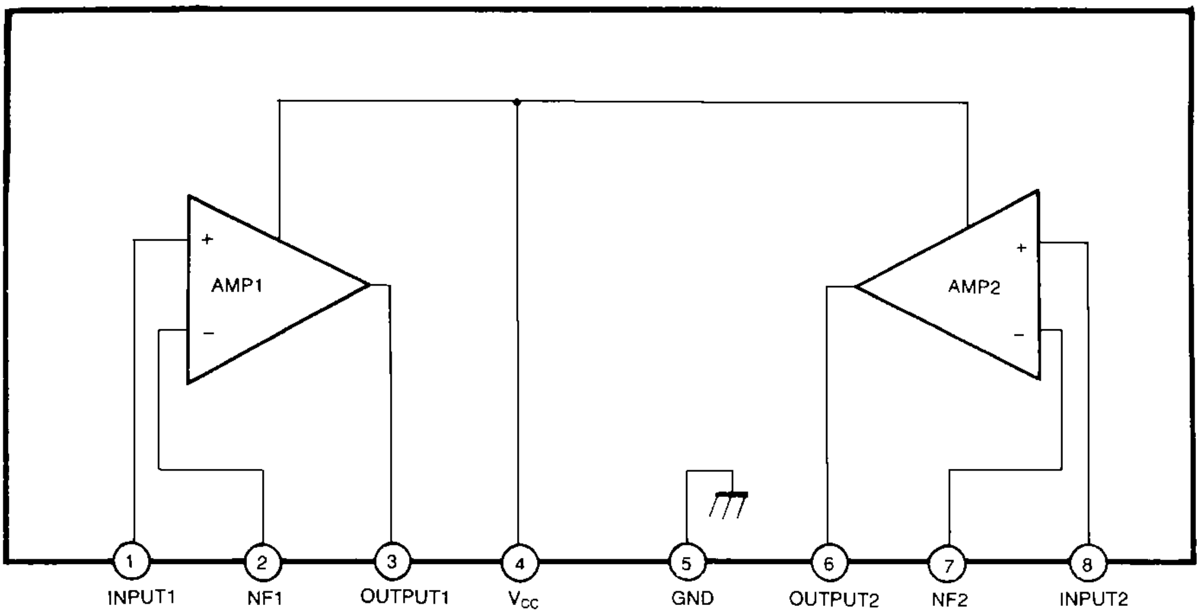


Fig. 1

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	18	V
Power Dissipation	P_D	200	mW
Operating Temperature	T_{OPR}	– 20 ~ + 70	°C
Storage Temperature	T_{STG}	– 40 ~ + 125	°C

ELECTRICAL CHARACTERISTICS

(Ta = 25°C, V_{CC} = 9V, R_L = 10KΩ, R_G = 600Ω, f = 1KHz, NAB, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Circuit Current	I_{CCQ}	$V_I = 0$		4.0	6.0	mA
Open Loop Voltage Gain	G_{VO}		65	80		dB
Closed Loop Voltage Gain	G_{VC}	$V_o = 0.5V$	33	35	37	dB
Output Voltage	V_o	THD = 1%	1.1	1.3		V
Total Harmonic Distortion	THD	$V_o = 0.5V$		0.1	0.3	%
Input Resistance	R_I		70	100		KΩ
Equivalent Input Noise Voltage	V_{NI}	R_G = 2.2KΩ BW (– 3dB) = 15Hz ~ 30KHz		1.0	2.0	μV
Cross Talk	CT	R_G = 2.2KΩ	50	65		dB

TEST CIRCUIT

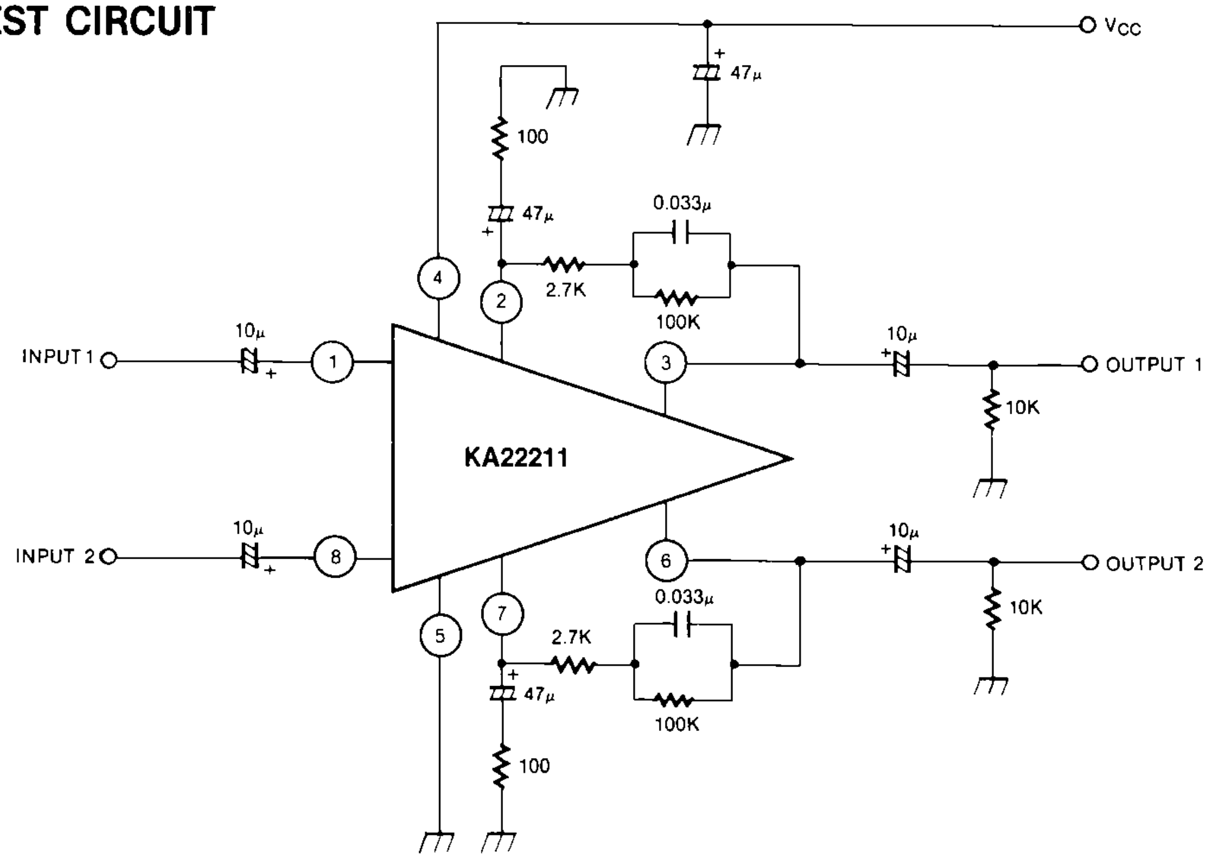


Fig. 2

APPLICATION INFORMATION

External Components

C_2 (C_9): Input coupling capacitor
These components are concerned with the output noise and operation starting time, and its capacitance is adequate for 10μF.
As C_2 (C_9) below 4.7μF extends the operation starting time, a capacitance of over 4.7μF is recommended.

C_3 (C_8): Negative feedback capacitor
These components decide the low cut-off frequency, which is determined as follows:

$$C_3 (C_8) = \frac{1}{2\pi f_L \cdot R_2 (R_7)}$$ where, f_L: low cut-off frequency.

A large C_3 (C_8) makes the operation starting time of an amplifier late. It's capacitance is adequate for 47μF.

C_4, R_3, R_2 (C_7, R_4, R_5): Equalizer network
This components decide the frequency response of an equalizer amplifier. The time constant of standard NAB characteristic is as follows:

Time Constant \ Tape Speed	9.5cm/sec	4.75cm/sec
C_4 (R_2+R_3)	3,180μsec	1,590μsec
C_4, R_2	90μsec	120μsec

C_{11} Filter capacitor of the power line
This should be located as close to the supply voltage pin (Pin 4) as possible. The recommended value is 47μF:

C_1 (C_{10}): Protection capacitor
These components protect against wave damage is strong electric fields and engine noise damage and block oscillation at high amplifying operation.

C_5 (C_6): Output coupling capacitor
The recommended value is 10μF.

APPLICATION CIRCUIT

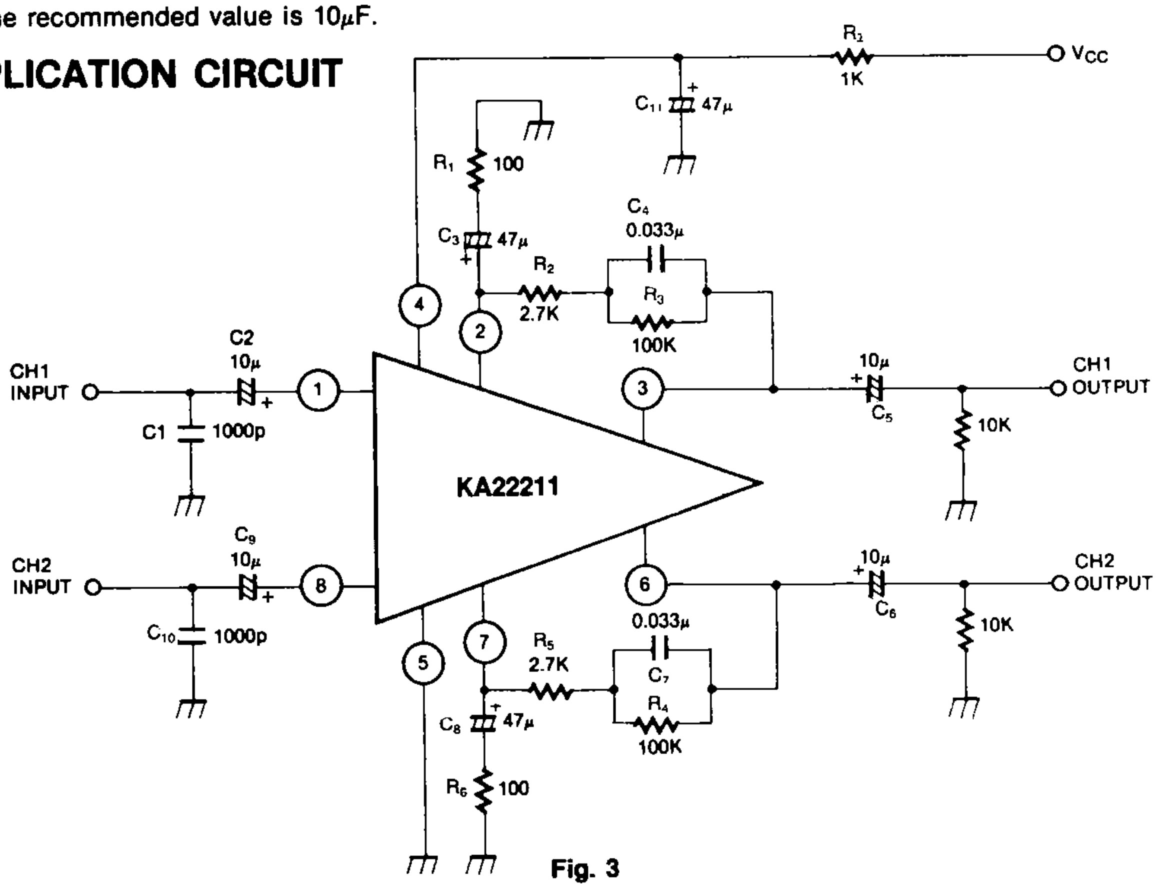


Fig. 3